

JAMES MADISON UNIVERSITY.

*Madison*

# **Science On a Sphere Programs for Middle School Groups: Ready-to-implement lessons & a teaching tutorial**

Christie-Joy Hartman, Jennifer Mangan,  
Kristen St. John & Christy Bradburn

April 26, 2017

# Teaching Demonstration

## Lessons

- 1: Globes vs. Maps (adapted)
- 2: Hurricanes
- 3: Tornadoes
- 4: Global Climate Change

DRAFT 012317.

DO NOT CIRCULATE.

© James Madison University, 2016

- REVIEW COPY: DO NOT CIRCULATE -

## SCIENCE ON A SPHERE PROGRAMS FOR MIDDLE SCHOOL GROUPS: READY-TO-IMPLEMENT LESSONS AND A TEACHING TUTORIAL

PILOT TEST, VERSION 2



**AUTHOR:**

Jennifer Mangan, Ph.D.

**EDITORS:**

Christie-Joy B. Hartman, Ph.D.  
Kristen St. John, Ph.D.  
Christy Bradburn

*Development of this material was partially supported by a grant from the Ohrstrom Foundation.*

# Elements of Each Lesson

The manual includes:



Learning Objectives<sup>1</sup>



VA SOL Correlations



Next Generation Science Standards



Dataset Descriptions



Student Handouts & Worksheets



Presentation Tips



Instructor Script



Audience Frequently Asked  
Questions (FAQs)



Pre & Post Lesson Assessment

# An Example: Hurricanes Lesson



## AUDIENCE FAQs

1. *Why is there a band with no hurricanes?*
  - o The Coriolis Effect, which is responsible for the rotation of hurricanes, increases with greater latitude from the equator, therefore tropical storms do not form at the poles.
2. *Why do hurricanes all move west?*
  - o This is largely due to the rotation of the Earth, which causes them to travel east to west. This is true for all large-scale weather systems.
3. *Why are hurricanes named?*
  - o It helps to ease confusion in busy times.
4. *Who names hurricanes?*
  - o The U.S. Weather Bureau and other agencies follow the guidelines set by the World Meteorological Organization. Names are given in alphabetical order, starting on the seventh year they start, though some infamous hurricanes have been reused.



## PRE & POST ASSESSMENT

The following assessment can be given to measure student knowledge before and after the lesson.

1. *Where on Earth do hurricanes form?*
  - a) The Arctic
  - b) Tropical oceans**
  - c) Over warm land
  - d) Antarctica
2. *What causes hurricanes to rotate?*
  - a) The Coriolis Effect**
  - b) Wind high in the atmosphere
  - c) The equator
  - d) The jet stream

# Teaching Demonstration



# Teaching Demonstration con't.

**Part 1: Framing the discussion in the classroom prior to using SOS (20 min)**

**Part 2: Utilizing the SOS climate model data sets (28 min)**

2a) Providing handouts with guided questions

Data Set Discussion: GFDL A1B Model - Temp Change w Business as Usual

2b) Orienting students to visualizations

Data Set Discussion: HAD A1B Model - Temp Change w Business as Usual

Data Set Discussion: GFDL B1 Model - Temp Change w MEF Scenario

Data Set Discussion: GFDL 3714 Model - Sea Ice Change

2c) Viewing visualizations multiple times

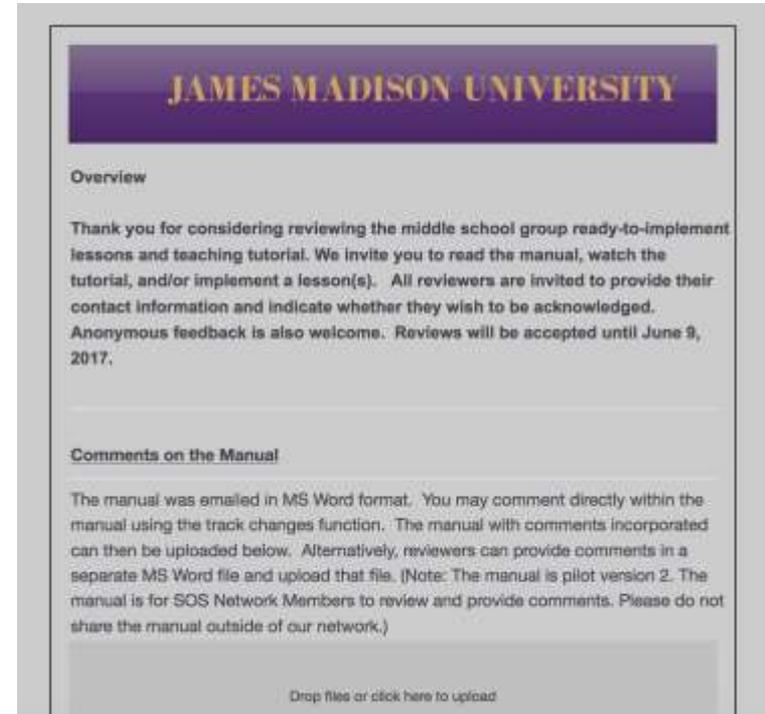
Data Set Discussion: GFDL Model - Precipitation Anomalies

**Part 3: Using the flat screen: summary & assessment (7 min)**

# Request for Comments

Would you please...

- Read through the manual\*
- Watch the tutorial\*; and/or
- Implement a lesson(s)
- Submit comments using an online form by June 9, 2017



The image shows a screenshot of a web form from James Madison University. At the top, there is a purple header with the text "JAMES MADISON UNIVERSITY" in gold. Below the header, the section is titled "Overview". The text in this section reads: "Thank you for considering reviewing the middle school group ready-to-implement lessons and teaching tutorial. We invite you to read the manual, watch the tutorial, and/or implement a lesson(s). All reviewers are invited to provide their contact information and indicate whether they wish to be acknowledged. Anonymous feedback is also welcome. Reviews will be accepted until June 9, 2017." Below this, there is a section titled "Comments on the Manual". The text in this section reads: "The manual was emailed in MS Word format. You may comment directly within the manual using the track changes function. The manual with comments incorporated can then be uploaded below. Alternatively, reviewers can provide comments in a separate MS Word file and upload that file. (Note: The manual is pilot version 2. The manual is for SOS Network Members to review and provide comments. Please do not share the manual outside of our network.)" At the bottom of the form, there is a grey box with the text "Drop files or click here to upload".

To obtain the links to the manual, video, and online feedback form, email me at [brodrickj@jmu.edu](mailto:brodrickj@jmu.edu)

***\*Please do not share beyond our network until finalized.***

# Discussion

- Do you already have resources like this?
- Is there other material that would be valuable?